

FIG. 1

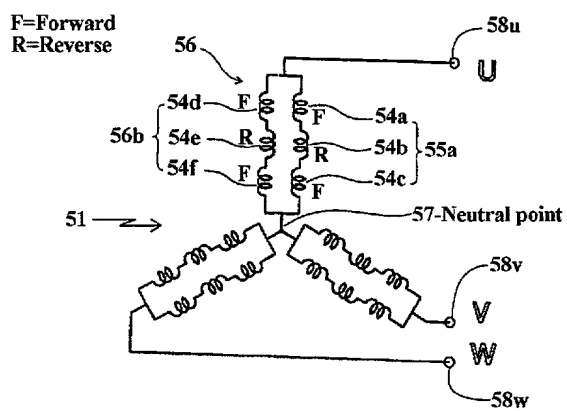


FIG. 2

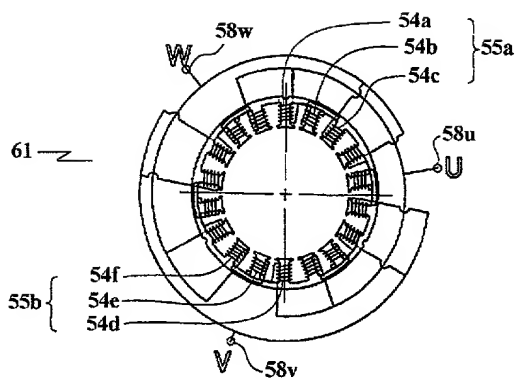


FIG. 3

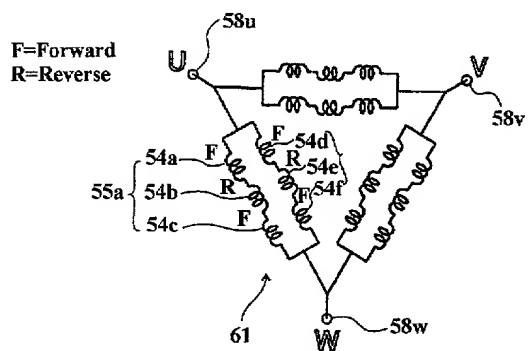


FIG. 4

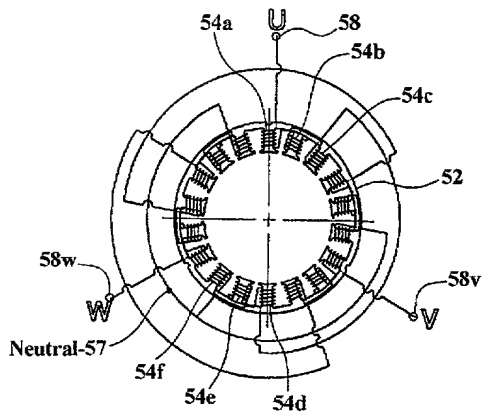


FIG. 5
(Prior Art)

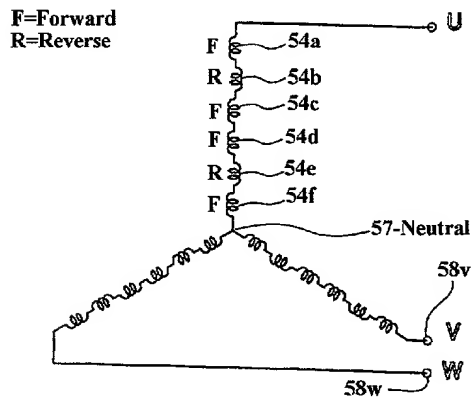


FIG. 6
(Prior Art)

F=Forward
R=Reverse

FIG. 7
(Prior Art)

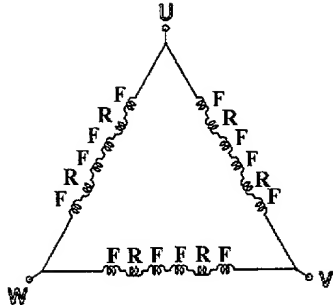


FIG. 8
(Prior Art)

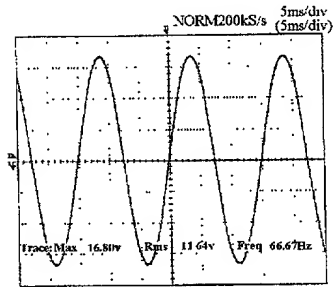


FIG. 9 (Prior Art)

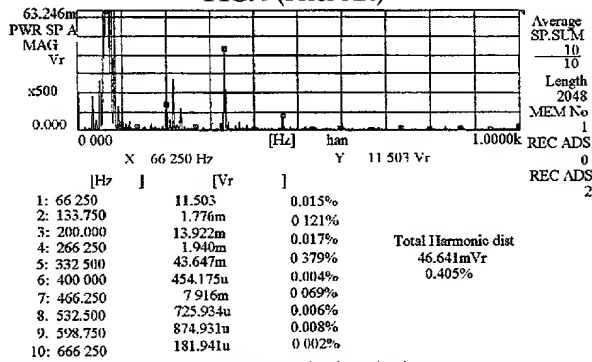


FIG. 10 (Prior Art)

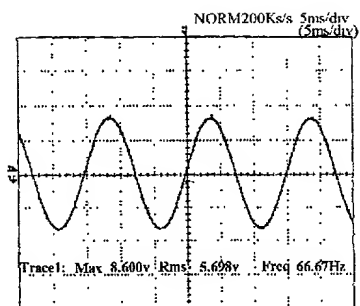
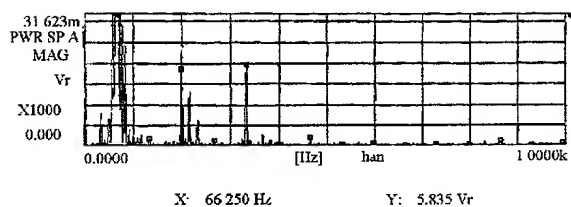


FIG. 11



AVERAGE
SP SUM
10
10
LENGTH
2048
MEM No
1
REC ADS
0
REC GAP
2

[Hz]	[Vr]	
1. 66.250	5.835	
2. 132.500	1.845m	0.032%
3. 198.750	18.777m	0.322%
4. 266.250	1.133m	0.019%
5. 332.500	19.801m	-0.339%
6. 398.750	63.237u	0.001%
7. 465.000	1.866m	0.032%
8. 531.250	289.257u	0.005%
9. 597.500	429.187u	0.007%
10. 665.000	89.289u	0.002%

Total Harmonic dist.
27.461mVr
0.471%

FIG. 13

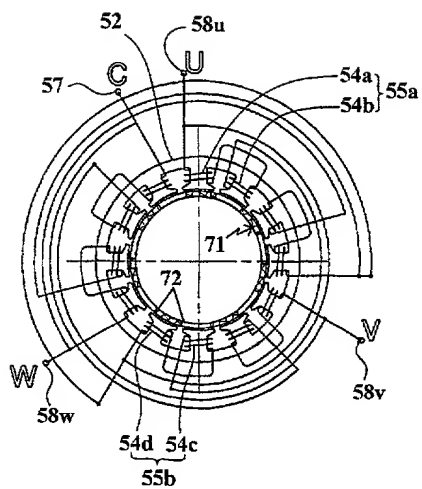


FIG. 14

F=Forward
R=Reverse

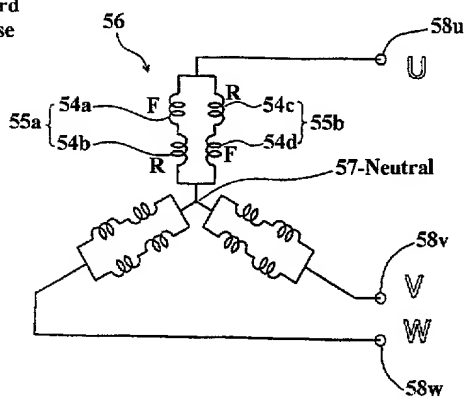


FIG. 15

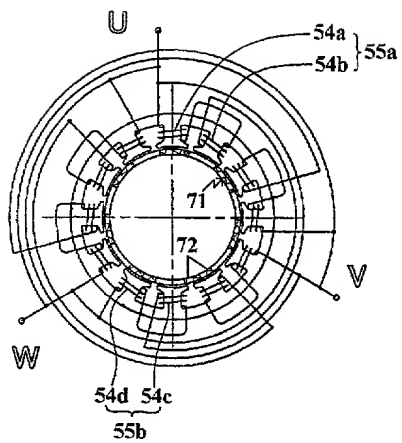


FIG. 16

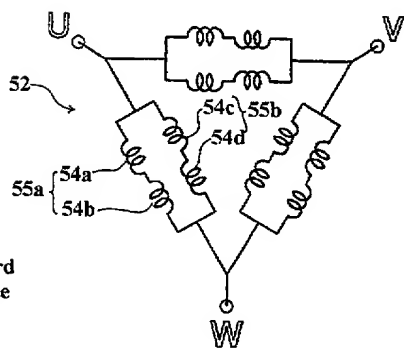


FIG. 17

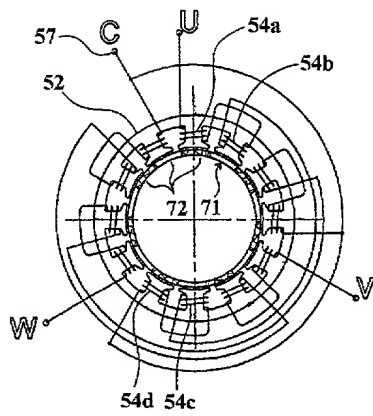


FIG. 18
(Prior Art)

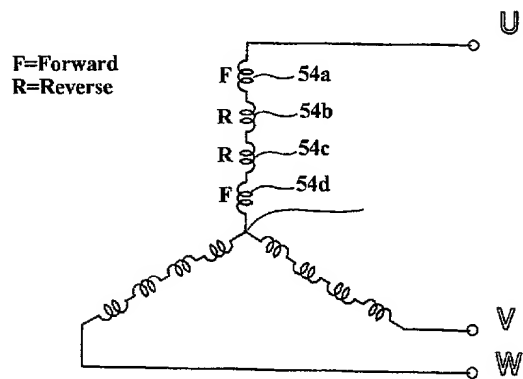


FIG. 19
(Prior Art)

Number m of slots

Number n of poles

	3	6	9	12	15	18
2	6 0.866	6 0.5	18 0.328	12 0.250	30 0.199	18 0.167
4	12 0.866	12 0.866	36 0.617	12 0.433	60 0.389	36 0.328
6	6 0	6 1.0	18 0.866	12 —	30 0.380	18 0.433
8	24 0.866	24 0.866	72 0.946	24 0.866	120 0.711	72 0.616
10	30 0.866	30 0.5	90 0.946	60 0.933	30 0.866	90 0.753
12	12 0	12 0	36 0.866	12 —	60 0.910	36 0.866
14	42 0.866	42 0.5	126 0.617	84 0.933	210 —	126 0.902
16	48 0.866	48 0.866	144 0.328	48 0.866	240 0.952	144 0.946
18	18 0	18 1.0	81 0	36 —	90 0.910	18 —
20	60 0.866	60 0.866	180 0.328	60 0.433	60 0.866	180 0.946
22	68 0.866	68 0.5	198 0.9024	132 0.711	330 0.617	198 0.902
24	24 0	24 0	72 0.866	24 0	120 0.381	72 0.866

y

z

x

Upper Row: cogging torque frequency Lower row: winding coefficient

Line x: $m = (3/4) \times n$

short-pitch winding coefficient 0.866

distributed winding coefficient

Line y: $m = (3/2) \times n$

short-pitch winding coefficient 0.866

distributed winding coefficient

Region Z: $(2/3)m < n < (4/3)m$

FIG. 20